

RESEARCH NOTE

HOW EFFECTIVE ARE POSTED SIGNS TO REGULATE TOURISM? AN EXAMPLE WITH NEW ZEALAND FUR SEALS

ALEJANDRO ACEVEDO-GUTIERREZ,* LISA ACEVEDO,†
OLGA BELONOVICH,‡ and LAURA BOREN§

*Department of Biology, Western Washington University, Bellingham, WA, USA
†Bellingham, WA, USA

‡Department of Wildlife & Fisheries Sciences, Texas A&M University, College Station, TX, USA

§LJBoren Marine Mammal Consultants, Richmond, New Zealand

Increased tourism has augmented harassment to wildlife and posted signs are commonly used to manage such interactions. This study determined whether signs increased tourist compliance with regulations to remain >10 m from New Zealand fur seals (*Arctocephalus forsteri*) at Kaikoura Peninsula. We observed 362 tourist groups interacting with seals. The percentage of groups in which all members respected the posted distance was similar whether tourists saw the signs or not [60.6% vs. 65.9%; $G(1) = 0.98$, $p = 0.32$]. Results indicate that posted signs were ineffective in increasing compliance to regulations and suggest that alternative approaches must be considered to increase regulation compliance and better manage interactions between tourists and wildlife.

Key words: Marine tourism; Compliance with regulations; Tourism management; Posted signs; Conservation

Introduction

Wildlife tourism has increased rapidly in most countries, generating significant resources for economic development and achieving conservation goals (Balmford et al., 2009; Giannacchini, 1993). Simultaneously, increased tourism has generated concerns over its potential impacts on wildlife and their environment (Newsome, Dowling, & Moore, 2005; Tapper, 2006). Hence the paradox: more

tourism provides benefits to wildlife yet it also poses increased dangers. To prevent such dangers, tourism is managed through regulations that are often difficult to enforce, resulting in inadequate compliance (Gorzelay, 2004; Quiros, 2007; Whit & Read 2006). Yet, posted signs are commonly used to mitigate interactions between tourists and wildlife. The objectives of this study were to determine whether posted signs increased compliance with land-based marine tourism regulations.

Methodology

The study was conducted at Kaikoura Peninsula, New Zealand, during austral summer 2009. The peninsula is occupied by resting adult and subadult New Zealand fur seals (*Arctocephalus forsteri*) and is accessible by a paved road that ends in a parking lot from which people can walk at sea level around the coastline (Boren, Gemmell, & Barton, 2009). Because of their close proximity to each other, interactions between humans and seals occur. Several posted signs on the peninsula stipulate that people remain >10 m from marine mammals on land, providing an ideal situation to document whether tourists comply with the regulations.

Trained observers were posted on various locations on top of a cliff with unobstructed views of tourists and seals. Observers recorded the actions of tourists from their arrival to their departure of the area. They tallied the number of tourists per group, the duration of their visit, whether they saw the posted signs or not, and their interactions with the seals. Any tourist who walked up to a sign was recorded as having seen the sign. An interaction was initiated when any member of the group observed a seal and ended when all members stopped paying attention to seals. During an interaction, observers recorded whether any member of the tourist group violated the 10-m distance or attempted to touch a seal, and whether any seal reacted away from the group. Due to the abrupt topography of the coastline, the use of a theodolite to measure distances was unfeasible. Rather, the distance between tourist groups and seals was estimated using the body length (BL) of the seals, which lay flat on the ground while resting and measure ca. 1.5 m (Jefferson, Leatherwood, & Webber, 1993). To be conservative, a distance of 5 BL (~7–8 m) was employed as a compliance threshold.

Duration of visit and number of people per group were compared with a *t*-test to ensure that the behavior of tourists who saw the signs was comparable to that of those who did not. Log-likelihood tests compared the frequency with which tourist groups who saw and who did not see the signs complied with the regulations, attempted to touch a seal, or caused a seal to react away.

Results

During 20 days of observation, 362 tourists groups interacting with seals were recorded; 236 saw the posted signs and 126 did not. Groups who saw and who did not see the signs were similar in number of people per group and duration of visit. The average duration was 25.8 ± 23.4 minutes for groups who saw the signs and 25.2 ± 24.7 minutes for groups who did not [$t(235, 125) = 0.23, p = 0.82$]. The average number of people per group was 2.9 ± 2.0 for groups who saw the signs and 3.2 ± 2.4 for groups who did not [$t(235, 125) = 1.39, p = 0.17$].

The percentage of groups in which all members remained >5 BL from a seal was the same whether they saw the signs or not [60.6% vs. 65.9%; $G(1) = 0.98, p = 0.32$]. Likewise, the percentage of groups in which at least one member attempted to touch a seal was similar whether they saw the signs or not [1.4% vs. 2.4%; $G(1) = 0.49, p = 0.48$]. There was also no difference in the percentage of groups that caused a seal to react away [11.7% vs. 8.7%; $G(1) = 0.75, p = 0.39$].

Despite our conservative threshold for compliance, posted signs did not increase compliance to regulations. Regardless of whether they saw the signs or not, tourists remained at the same distance from the seals; they also attempted to touch them with the same frequency and caused seals to react away at the same low frequencies. Results agree with evidence that unenforced regulations are ineffective management strategies (e.g., Pagh 1999). In the case of Kaikoura Peninsula, seals appear resilient to the presence of tourists but the long-term impact of the behavior of tourists on the seals remains to be examined.

Conclusions

This study provides evidence that posted signs are ineffective in increasing compliance to regulations and suggests that alternative approaches must be considered to increase regulation compliance and better manage interactions between tourists and wildlife.

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Biographical Notes

Alejandro Acevedo-Gutiérrez is an Associate Professor of Biology and Science Education in Western Washington University, Bellingham, WA, USA. He studies the interactions between marine mammals and their environment as well as effective strategies to teaching science.

Lisa Acevedo is a Special Education High School teacher in Ferndale High School, Ferndale, WA, USA. She also conducts outreach teaching marine conservation to children and their families.

Olga Belonovich is a Ph.D. student at Texas A&M University, Department of Wildlife & Fisheries Sciences, College Station, TX, USA. Her work concentrates on the behavioral ecology of pinnipeds.

Laura J. Boren is currently National Marine Mammal Coordinator for the Department of Conservation in Wellington, New Zealand. She obtained her Ph.D. in Zoology at Canterbury University. Her research focuses on the effects of fisheries and tourism on marine mammals and seabirds.

References

- Balmford, A., Beresford, J., Green, J., Naidoo, R., Walpole, M., & Manica, A. (2009). A global perspective on trends in nature-based tourism. *Plos Biology*, 7, e1000144.
- Boren, L. J., Gemmell, N., & Barton, K. (2009). The role and presence of a guide: Preliminary findings from swim with seal programs and land-based seal viewing in New Zealand. *Tourism in Marine Environments*, 5(2-3), 187-199.
- Giannacchini, J. (1993). Ecotourism: New partners, new relationships. *Conservation Biology*, 7(2), 429-432.
- Gorzelay, J. F. (2004). Evaluation of boater compliance with manatee speed zones along the Gulf Coast of Florida. *Coastal Management*, 32, 215-226.
- Jefferson, T. A., Leatherwood, S., & Webber, M. A. (1993). *Marine mammals of the world*. Rome: United Nations Environmental Program.
- Newsome, D., Dowling, R. K., & Moore, S. A. (2005). *Wildlife tourism: Aspects of tourism*. Clevedon, UK: Multilingual Matters Limited Books.
- Pagh, P. (1999). Denmark's compliance with European community environmental law. *Journal of Environmental Law*, 11, 301-319.
- Quiros, A. L. (2007). Tourist compliance to a Code of Conduct and the resulting effects on whale shark (*Rhinodon typus*) behavior in Donsol, Philippines. *Fisheries Research*, 84, 102-108.
- Tapper, R. (2006). *Wildlife watching and tourism: A study on the benefits and risks of a fast growing tourism activity and its impact on species*. Bonn: United Nations Environmental Program.
- Whit, A. D., & Read, A. J. (2006). Assessing compliance to guidelines by dolphin-watching operators in Clearwater, Florida, USA. *Tourism in Marine Environments*, 3(2), 117-130.